



Department of Energy

Richland Operations Office  
P.O. Box 550  
Richland, Washington 99352

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94-RPS-171

APR 07 1994

Mr. A. W. Conklin, Head  
Air Emissions and Defense  
Waste Section  
State of Washington  
Department of Health  
P.O. Box 47827  
Olympia, Washington 98504-0095

Dear Mr. Conklin:

COMPLIANCE WITH AIR PERMIT CONDITIONS, AIR 93-908 AND 93-928; NOTICE OF  
CONSTRUCTION FOR THE 105-KE BASIN ENCAPSULATION ACTIVITY

Enclosed please find the additional information required by 3 of the  
21 conditions and additional requirements which were transmitted by the State  
of Washington Department of Health (DOH) to Mr. J. D. Bauer, U.S. Department  
of Energy, Richland Operations Office, on September 13, 1993, (letter number  
AIR 93-908) and on October 14, 1993, (letter number AIR 93-923).

Should you have questions, please contact me or Mr. S. D. Stites of my staff  
on (509) 376-8566.

Sincerely,

James D. Bauer, Program Manager  
Office of Environmental Assurance,  
Permits, and Policy

EAP:SDS

Enclosure

cc w/encl:  
Administrative Records

cc w/o encl:  
J. J. Luke, WHC  
D. J. Watson, WHC

94-RPS-171



Response to the  
Air Permit Conditions  
for the Notice of Construction  
for the 105-KE Basin Encapsulation Activity

**Reference:** Letter 93-908, Condition 11: "Power must be provided for an ambient air sampler for the DOH at a location designated by the department's Environmental Radiation Section. (contact Al Danielson at 545-2209)."

**Response:** Al Danielson, State of Washington Department of Health (DOH) was notified on February 16, 1994, that an electrical outlet was available at the newly installed Westinghouse Hanford Company ambient air monitoring station directly east of the 105-KE Building.

**Reference:** Letter 93-923, Additional Requirement 1: "Transmit the procedures used to collect water samples, and to analyze the water samples taken once per shift."

**Response:** Enclosed are the following documents relating to KE Basin water sampling and analysis:

1. WHC-SD-NR-QAPP-006, "105 KE Fuel Storage Basin Sampling and Analysis Quality Assurance Plan."
2. WHC-SD-NR-PLN-014, "105 KE Fuel Storage Basin Water Sample Analysis Plan."
3. K Basins Operations Procedure 59-43-5, "Collect Primary and Secondary Water Samples at 105 KE."
4. K Basins Operations Procedure 59-06-01, "Perform Routine Patrol 105 KE Irradiated Fuel Storage Basin."
5. K Basins Operations Procedure 59-43-9, "Collect Basin Grab Samples Using Portable Masterflex Pump."
6. K Basins Operations Procedure 59-43-10, "Collect Center of Basin Air Permit Water Sample."
7. WHC-SD-GN-10002, "100 Area Health Physics Receiving Analyzing, and Reporting Operations Process Monitoring Water Samples."
8. 100 Areas Health Physics Desk Instruction FHP-122, "Operation of the Camberra Accuspec Gamma Spectroscopy System."
9. 100 Areas Health Physics Desk Instruction FHP-125, "Daily Source Check of the Camberra Accuspec Gamma Spectroscopy System."
10. 100 Areas Health Physics Desk Instruction FHP-126, "Background Protocols for the Camberra Accuspec Gamma Spectroscopy System."

94322.203

IMPACT LEVEL 3ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 5	REV. 1
SUPERSEDES ISSUE DATED 6-4-93		ISSUE DATE FEB 11 1994	PAGE NO. 1 OF 15	

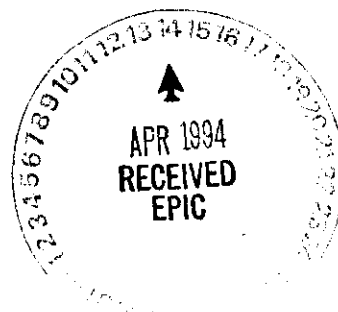
COLLECT PRIMARY AND SECONDARY WATER SAMPLES AT 105-KE

PREPARED BY

Dennis Strage 2-7-94  
Plant Engineer Date  
Robert J. Sanku 2-9-94  
K Basins Analyst Date

APPROVED BY

Dennis Strage 2-11-94  
Procedure Development Date  
Robert J. Sanku 2-9-94  
K Basin Operations Date  
Ray E. Hardman 2-10-94  
Engineering Date  
SS Lucas 2-9-94  
OA&WH Date  
Kerry Alanson 2-11-94  
Facility Health Physics Date  
J.I. Diehl J.I. DIEHL 2-10-94  
Quality Assurance Date  
W. H. H. H. 2-10-94  
Environmental Compliance Date  
Craig Z. Bennett 2-7-94  
Safety Technical Support Date  
W. H. H. H. 2-9-94  
N Facilities Safety Assurance Date  
Cara S. Spauline 2-10-94  
Operator Date



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IMPACT LEVEL 3ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 5	REV. 1
SUPERSEDES ISSUE DATED 6-4-93		ISSUE DATE FEB 11 1994	PAGE NO. 2 OF 15	

COLLECT PRIMARY AND SECONDARY WATER SAMPLES AT 105-KE

Initiated: Date \_\_\_\_\_ Time \_\_\_\_\_ Manager \_\_\_\_\_

Completed: Date \_\_\_\_\_ Time \_\_\_\_\_ Manager \_\_\_\_\_

Review for Completeness: Shift Manager \_\_\_\_\_

OPERATOR'S INITIALS REGISTER	
All operators performing steps in this procedure are required to register their name and initials below.	
1. _____ Print Name	_____ Initials
2. _____ Print Name	_____ Initials
3. _____ Print Name	_____ Initials

Introduction

This is a procedure to collect water samples from the primary water system and secondary cooling system at 105-KE. To detect any contamination or changes in the water quality in 105-KE basin, a program of water sampling is maintained. The storage basin water (primary system water) and the cooling water through the water cooled chiller (the secondary system) are sampled.

941322.2105

IMPACT LEVEL 3ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 5	REV. 1
SUPERSEDES ISSUE DATED 6-4-93		ISSUE DATE FEB 11 1994		PAGE NO. 3 OF 15

### Introduction (contd.)

A series of water samples to be taken are listed in the 105-KE Sample Logbook kept in Shift Manager's office, Room 7. The following is a list of NPDES, process monitoring water samples, and efficiency samples covered by this procedure:

SAMPLE LOCATION	SAMPLE POINT	FREQUENCY	TYPE OF SAMPLE
Center of Basin	10	Weekly	Grab
Ion Column Inlet	9	Bi-weekly	Grab
Ion Column Outlet No. 1	1	Bi-weekly	Composite
Ion Column Outlet No.2	2	Bi-weekly	Composite
Ion Column Outlet No.3	3	Bi-weekly	Composite
Cartridge Filter Inlet	4	Bi-weekly	Composite
Cartridge Filter Outlet	5	Bi-weekly	Composite
Sand Filter Inlet	11	Bi-weekly	Composite
Sand Filter Outlet	12	Bi-weekly	Composite
East Weir	14	Monthly	Grab
IXM Inlet	15	Bi-weekly	Composite
IXM Outlet	16	Bi-weekly	Composite
Centrifugal Chiller Secondary Water NPDES	CHILLER	Weekly	Grab
Ion Column Inlet      Efficiency Sample	9	As scheduled	Grab
Ion Column Outlet No.1      Efficiency Sample	1	As scheduled	Grab
Ion Column Outlet No.2      Efficiency Sample	2	As scheduled	Grab
Ion Column Outlet No.3      Efficiency Sample	3	As scheduled	Grab
IXM Inlet      Efficiency Sample	15	As scheduled	Grab
IXM Outlet      Efficiency Sample	16	As scheduled	Grab
Center of Basin      Efficiency Sample	10	As scheduled	Grab

947322-2106

IMPACT LEVEL 3ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 5	REV. 1
SUPERSEDES ISSUE DATED 6-4-93		ISSUE DATE FEB 11 1994		PAGE NO. 4 OF 15

### References

HSRCM-1, Hanford Site Radiological Control Manual  
 WHC-SD-NR-PLN-014, Sample Analysis Plan for the 105KE Fuel Storage Basin  
 WHC-CM-1-6, WHC Radiological Control Manual  
 WHC-CM-2-14, Hazardous Material Packaging and Shipping  
 WHC-CM-4-3, Industrial Safety Manual  
 WHC-CM-5-13, K Basins Policy Manual, 16-04  
 WHC-CM-7-5, Environmental Compliance Manual  
 WHC-NR-M-2, Vol 3, Process Standards, C-303 and D-403  
 WHC-NR-M-12, Operations Analysis and Waste Handling (OA&WH) Manual

### Safety

Safety Classification 3.  
 Comply with applicable RWPs and the approved Radiation Area Entry Permit.  
 Wear protective clothing as required by RWP.  
 Open sample valves slowly and do not splash water. Primary water is contaminated and other water sampled is to be treated as potentially contaminated.  
 Properly secure and label each bottle for transporting.  
 Follow all standard and posted safety rules.

Shaded text refers to Process Standard limits and controls. If a Process Standard limit and/or control is NOT in compliance, CONTACT MANAGER IMMEDIATELY.

### Special Tools, Equipment, and Supplies

New 500 ml poly sample bottles  
 Preprinted sample labels (obtained from OA&WH Sample Management)  
 OA&WH Sample Chain-of-Custody Record  
 Onsite Routine Radioactive Shipment Record (ORRSR)  
 OA&WH Controlled logbooks

### Prerequisites

Compliance with Process Standards D-403.  
 Sample taker has the required training per WHC-CM-7-5, Environmental Compliance, section 11.  
 Continuous Health Physics Technician coverage (HPT) for special samples.

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IMPACT LEVEL  3ESQ	SYSTEM  59-43	ZONE/BLDG  105-KE	TASK NO./PANEL NO.  5	REV.  1
SUPERSEDES ISSUE DATED  6-4-93		ISSUE DATE  FEB 11 1994		PAGE NO.  5 OF 15

Procedure

Date Initial

NOTE: Special samples may need to be taken at the request of Environmental Compliance or OA&WH Sample Management or when routine samples cannot be taken. Coordinate any actions through the K Basin Shift Manager or delegate and OA&WH Sample Management.

I. COLLECT SAMPLES

A. Composite Samples

1. Obtain new 500 ml poly sample bottle for each sample. Write sample point on each bottle with a permanent marker.
2. Collect the following composite samples per steps I.A.3 through I.A.10:

Composite Sample / (Sample Point No.)	Date	Initial
Ion Column Outlet (1)		
Ion Column Outlet (2)		
Ion Column Outlet (3)		
Cartridge Filter Inlet (4)		
Cartridge Filter Outlet (5)		
IXM Inlet (15)		
IXM Outlet (16)		
Sand Filter Inlet (11)		
Sand Filter Outlet (12)		

3. Set sample station ON/OFF switch to OFF and close composite supply valve.
4. Shake 5-gallon composite sample container to ensure a representative sample.
5. Fill corresponding sample bottle with sample from composite container.

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IMPACT LEVEL 3ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 5	REV. 1
SUPERSEDES ISSUE DATED 6-4-93		ISSUE DATE FEB 11 1994		PAGE NO. 6 OF 15

Procedure (contd.)

Date Initial

6. Discard remaining contents of 5-gallon composite sample container into the basin.
7. Rinse 5-gallon composite sample container with demineralized water.
8. Replace 5-gallon composite sample container into sample station.
9. Wipe down sample stations and equipment.
10. Open composite sample valve and set sample station ON/OFF switch to ON.

B. Grab Samples

1. Obtain new 500 ml poly sample bottle for each sample. Write sample point on each bottle with a permanent marker.
2. Collect the following grab samples per steps I.B.3 and I.B.5:

NOTE: If a center of basin sample cannot be obtained, the grab sample may be obtained from the cartridge filter inlet line when in service or from the sand filter inlet line when the skimmer pump is in service. Operating procedure 59-43-9 may be used to obtain center of basin sample using the portable Masterflex pump.

Grab Sample / (Sample Point No.)	Date	Initial
Ion Column Inlet (9)		
Center of Basin (10)		
East Weir (14)		
Centrifugal Chiller Secondary Water (CHILLER)		

3. Purge sample line to ensure clean sample.

9413221.2109



IMPACT LEVEL 3ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 5	REV. 1
SUPERSEDES ISSUE DATED 6-4-93		ISSUE DATE FEB 11 1994		PAGE NO. 7 OF 15

Procedure (contd.)

Date Initial

4. Fill corresponding sample bottle with sample from sample line.
5. Wipe down sample stations and equipment.
6. Deliver NPDES Chiller sample to HPT office after survey and labeling.

C. Special Samples

NOTE: Special samples may need to be taken at the request of Environmental Compliance or OA&WH Sample Management or when routine samples cannot be taken. Coordinate any actions through the K Basin Shift Manager or delegate and OA&WH Sample Management.

IF special samples are to be taken, GO to step C.1.

OTHERWISE, NA Section C., and GO to Section D.

1. Obtain new 500 ml poly sample bottle for each sample. Write sample point on each bottle with a permanent marker.

Ⓜ

2. Have HPT survey dose rates as samples are drawn. Have HPT sign HP Hold Point Checklist on page 14.

IF sample exceeds dose rate as specified in the RWP, GO to step C.3.

Otherwise, OMIT steps C.3 and C.4, and GO to step C.5.

3. Pour sample into basin and collect another sample. This step may be repeated one time.

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IMPACT LEVEL 3ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 5	REV. 1
SUPERSEDES ISSUE DATED 6-4-93		ISSUE DATE FEB 11 1994		PAGE NO. 8 OF 15

Procedure (contd.)

Date Initial

IF sample dose rate still exceeds limits, GO to step C.4.

Otherwise, NA step C.4 and GO to step C.5.

4. Contact K Basin Operations Manager and OA&WH immediately and explain the status of the dose rates. Special shipping requirements may have to be arranged with OA&WH.

NOTE: Special composite samples are to be collected as specified in steps I.A.3 through I.A.10. Special grab samples are to be collected as specified in steps I.B.3. and I.B.5.

5. Collect Special Samples. Record sample location and type of sample under "Special Sample" heading below.

Special Samples	Date	Initial

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IMPACT LEVEL 3ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 5	REV. 1
SUPERSEDES ISSUE DATED 6-4-93		ISSUE DATE FEB 11 1994		PAGE NO. 9 OF 15

Procedure (contd.)

Date Initial

D. Efficiency Samples

NOTE: Efficiency samples must be taken at least once per week to comply with WHC-SD-NR-PLN-014, Sample Analysis Plan for the 105KE Fuel Storage Basin.

1. Obtain new 500 ml poly sample bottle for each sample. Write sample point on each bottle with a permanent marker.
2. Collect the following efficiency grab samples as scheduled by OA&WH (minimum, one per week) per steps I.D.3 and I.D.5.

NA days when samples are not required.

Efficiency Grab Sample/ (Sample Point No.)	Date	Date	Date	Date	Date
	Initial	Initial	Initial	Initial	Initial
Ion Column Inlet (9)					
Ion Column Outlet (1)					
Ion Column Outlet (2)					
Ion Column Outlet (3)					
IXM Inlet (15)					
IXM Outlet (16)					
Center of Basin (10)					

3. Purge sample line to ensure clean sample.
4. Fill corresponding sample bottle with sample from sample line.
5. Wipe down sample stations and equipment.
6. Go to Section II to package and transport efficiency samples.

94322.212

IMPACT LEVEL 3ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 5	REV. 1
SUPERSEDES ISSUE DATED 6-4-93		ISSUE DATE FEB 11 1994	PAGE NO. 10 OF 15	

Procedure (contd.)

Date Initial

E. Equipment Malfunction/Sample Unavailable

IF an equipment malfunction is detected or a sample cannot be taken, GO to step E.1.

Otherwise, NA steps E.1 thru E.3, and GO to Section II.

1. Record in appropriate sample log all pertinent information, including the date, time, and reasons why a sample could not be taken. \_\_\_\_\_
2. Notify OA&WH of discrepancy. \_\_\_\_\_
3. Obtain signature of K-Basin Manager/Shift Manager in the Sample logbook to verify sampling and information regarding status of sampling equipment during sampling period. \_\_\_\_\_
4. Notify Environmental Compliance within one working day. \_\_\_\_\_

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IMPACT LEVEL  3ESQ	SYSTEM  59-43	ZONE/BLDG  105-KE	TASK NO./PANEL NO.  5	REV.  1
SUPERSEDES ISSUE DATED  6-4-93		ISSUE DATE  FEB 11 1994		PAGE NO.  11 OF 15

Procedure (contd.)

Date Initial

II. PACKAGE SAMPLES

1. Have HPT survey sample and attach radiation label to each sample with dose rates, contamination levels, date of survey, and initials of person performing survey.

Composite Samples / (Sample Point No.)	Date	Initial
Ion Column Outlet (1)		
Ion Column Outlet (2)		
Ion Column Outlet (3)		
Cartridge Filter Inlet (4)		
Cartridge Filter Outlet (5)		
Sand Filter Inlet (11)		
Sand Filter Outlet (12)		
IXM Inlet (15)		
IXM Outlet (16)		
Grab Samples		
Ion Column Inlet (9)		
Center of Basin (10)		
East Weir (14)		
Centrifugal Chiller Secondary Water (CHILLER)		
Special Samples (if applicable)		

947322.2119

IMPACT LEVEL  3ESQ	SYSTEM  59-43	ZONE/BLDG  105-KE	TASK NO./PANEL NO.  5	REV.  1
SUPERSEDES ISSUE DATED  6-4-93		ISSUE DATE  FEB 11 1994		PAGE NO.  12 OF 15

Procedure (contd.)

Date Initial

- (contd.) 1. Have HPT survey sample and attach radiation label to each sample with dose rates, contamination levels, date of survey, and initials of person performing survey.

Efficiency Grab Sample/ (Sample Point No.)	Date	Date	Date	Date	Date
	Initial	Initial	Initial	Initial	Initial
Ion Column Inlet (9)					
Ion Column Outlet (1)					
Ion Column Outlet (2)					
Ion Column Outlet (3)					
IXM Inlet (15)					
IXM Outlet (16)					
Center of Basin (10)					

NOTE: Samples may be grouped together on one Chain of Custody Record according to the destination laboratory.

2. Initiate a Chain of Custody Record for each sample. \_\_\_\_\_

NOTE: Labels for samples are available in OA&WH Controlled Sampling logbooks located in the Manager's office, Room 1.

NOTE: Sample ID numbers are provided by OA&WH.

3. Fill out label for each sample and attach label to sample container. \_\_\_\_\_
4. Verify all sample information has been recorded in either the KE Process Monitoring Sample logbook or the KE Efficiency Sample logbook for each sample. \_\_\_\_\_
5. Have qualified operator prepare samples for shipment per instructions on the ORRSR. \_\_\_\_\_

94322-215

IMPACT LEVEL 3ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 5	REV. 1
SUPERSEDES ISSUE DATED 6-4-93		ISSUE DATE FEB 11 1994	PAGE NO. 13 OF 15	

Procedure (contd.)

Date Initial

6. Have qualified operator complete and sign ORRSR per WHC-CM-2-14, Part IV, 1.4, Onsite Routine Radioactive Shipments.

\_\_\_\_\_

NOTE: ORRSR Record and Chain of Custody Record Sheet must accompany samples during shipment.

7. Deliver samples to or designated lab, and after the "received by" box is signed by the lab tech, sign the "relinquished by" box on the Chain of Custody Record Sheet.
8. Deliver a copy of the Chain of Custody Record Sheet to 105-KE Basin Shift Manager for record keeping in the Chain of Custody logbook located in the Shift Manager's office, room 7.
9. Deliver the carbon copy of the Chain of Custody Record Sheet to OA&WH.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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### Procedure Deviations/Discrepancies

To record deviations this report must include identification of the instruction(s) deviated from, the reason for deviation, and the duration of the change. Information must be validated by signature(s) of approver(s).

[illegible]

Approver(s)/Date

IMPACT LEVEL	SYSTEM	ZONE/BLDG.	TASK NO./PANEL NO.	REV.	SUPERSEDES ISSUE DATED	ISSUE DATED	Page
3ESQ	59-43	105-KE	5	1	6-4-93	FEB 11 1994	15 of 15

IMPACT LEVEL 3ESQ	SYSTEM 59-06	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 1	REV. 5
SUPERSEDES ISSUE DATED 5-22-93		ISSUE DATE AUG 27 1993	PAGE NO. 1 OF 14	

## CONTROL MASTER

PERFORM ROUTINE PATROL OF 105-KE IRRADIATED FUEL STORAGE FACILITIES

PREPARED BY

Dennis Strega 8-26-93  
Plant Engineer Date

J.M. Abuslar 8-26-93  
K Basin Operations Analyst Date

APPROVED BY

SK Foreman 8-27-93  
Procedure Development Date

John Dent 8/26/93  
K Basin Operations Date

Stephen 8/26/93  
Engineering Date

J.I. Diehl 8-26-93  
Quality Assurance Date

Lee C. Huel 8/26/93  
Industrial Safety Date

Mark Kenna for C. Bennett 8/26/93  
Safety Technical Support Date

J. Zivic 8/26/93  
Environmental Compliance Support Date

Robert 8/26/93  
Hazardous & Radiological Waste Control Date



617-776746

IMPACT LEVEL  3ESQ	SYSTEM  59-06	ZONE/BLOG  105-KE	TASK NO./PANEL NO.  1	REV.  5
SUPERSEDES ISSUE DATED  5-22-93		ISSUE DATE  AUG 27 1993	PAGE NO.  2 OF 14	

PERFORM ROUTINE PATROL OF 105-KE IRRADIATED FUEL STORAGE FACILITIES

Initiated: Date \_\_\_\_\_ Time \_\_\_\_\_ Manager \_\_\_\_\_

Completed: Date \_\_\_\_\_ Time \_\_\_\_\_ Manager \_\_\_\_\_

Review for Completeness: Shift Manager \_\_\_\_\_

**CONTROL MASTER**

OPERATOR'S INITIALS REGISTER	
All operators performing steps in this procedure are required to register their name and initials below.	
1. _____ Print Name	_____ Initials
2. _____ Print Name	_____ Initials
3. _____ Print Name	_____ Initials

Introduction

This is a procedure to perform a routine patrol of irradiated fuel storage facilities at 105-KE.

Routine patrol is an essential element in the safe and efficient operation of the irradiated fuel storage facilities. The operator taking patrol checks equipment and conditions in the facility and records readings as specified in the patrol sheet. The operator must be alert for any unsafe or unusual conditions in the facility. Any unsafe or unusual conditions must be reported promptly to the Shift Manager.

References

HSRCM-1, Hanford Site Radiological Control Manual  
 WHC-CM-1-6, WHC Radiological Control Manual  
 WHC-CM-4-3, Industrial Safety Manual  
 WHC-CM-5-13, N/K Operations Control Manual, 16-04  
 WHC-CM-5-28, K-Area Operations Safety Requirements  
 WHC-NR-M-2, Vol 3, N Reactor Facilities Process Standards C-303, D-400, and D-403

947322-2120

IMPACT LEVEL 3ESQ	SYSTEM 59-06	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 1	REV. 5
SUPERSEDES ISSUE DATED 5-22-93		ISSUE DATE AUG 27 1993	PAGE NO. 3 OF 14	

## Safety

## CONTROL MASTER

### Safety Classification 3.

Comply with applicable RWP's and the approved Radiation Area Entry Permit.  
Stay clear of any moving parts while checking operating pumps and equipment.  
Use thermometers when checking bearing temperatures to avoid burns.  
Make certain that entry door is secured in open position and lights are on before entering all sumps.  
Follow all standard and posted building safety rules.

Patrol sheet items with a heavy black border refer to Process Standard limits and controls.

IF a Process Standard limit and/or a control is NOT in compliance, CONTACT SUPERVISION IMMEDIATELY.

## Special Tools, Equipment, and Supplies

Clipboard  
Flashlight  
Patrol Sheet

## Prerequisites

A Confined Space Entry Permit must be obtained and reviewed by all job participants before start of job if access to the caissons is necessary.  
Buddy system required for entry into basin.

## Procedure

Date Initial

### I. PERFORM ROUTINE PATROL OF 105-KE IRRADIATED FUEL STORAGE FACILITIES

1. Perform routine patrol at earliest practical time on day shift, seven days a week. \_\_\_\_\_
2. Check and initial each item on patrol sheet.  
Record any abnormal conditions or discrepancies on the sheet. \_\_\_\_\_

NOTE: "Normal Range" on Patrol Sheet are not Process Standard limits.

3. Record on patrol sheet all items that are unsafe and/or out of "Normal Range." Report items to the Shift Manager immediately. \_\_\_\_\_

940322-2121

IMPACT LEVEL  3ESQ	SYSTEM  59-06	ZONE/BLDG  105-KE	TASK NO./PANEL NO.  1	REV.  5
SUPERSEDES ISSUE DATED  5-22-93		ISSUE DATE <b>AUG 27 1993</b>		PAGE NO.  4 OF 14

Procedure (contd.)

## CONTROL MASTER

Date Initial

4. Check all operating pumps and equipment for bearing temperature and any unusual noise or vibration.

**NOTE:** Construction joint test holes at 105-KE and at 105-KW shall be inspected on a weekly basis for presence of standing water. If standing water is observed, measurement of the water level shall be made and results shall be forwarded to the Manager, 100 Areas Environmental Compliance Support and Manager, Safety Technical Support for evaluation within 72 hours from time of measurement.

IF standing liquid is observed in the construction joint test holes, GO TO step 5.

OTHERWISE, NA steps 5 thru 10, and GO TO step 11.

5. Measure the liquid level in construction joint test holes. Record liquid level on Patrol Sheet, page 10, and Shift Managers Logbook. Compare level to previous liquid level reading from Shift Managers Logbook.

6. Have Manager notify the Manager, 100 Areas Environmental Compliance Support and Manager, Safety Technical support of the liquid level reading.

IF liquid level is more than one inch greater than previous liquid level reading, GO TO step 7.

OTHERWISE, NA steps 7 through 10, and GO TO step 11.

7. Notify the Manager, K Basing or designee, within 8 hours of liquid level increase.

8. Collect special sample per operating procedure 59-43-5, "Collect Primary and Secondary Water Samples at 105-KE."

2212-1228116

IMPACT LEVEL  3ESQ	SYSTEM  59-06	ZONE/BLDG  105-KE	TASK NO./PANEL NO.  1	REV.  5
SUPERSEDES ISSUE DATED  5-22-93		ISSUE DATE  AUG 27 1993		PAGE NO.  5 OF 14

Procedure (contd.)

## CONTROL MASTER

Date Initial

9. Contact H&RWC for instruction to label and ship sample to a qualified laboratory for a full gamma scan, for pH, and for a strontium-90 analysis. \_\_\_\_\_
10. Have Manager record and report results of sample analysis to the Manager, 100 Areas Environmental Compliance Support and Manager, Safety Technical Support within 24 hours of receipt of sample results. \_\_\_\_\_
11. Record any potential security items such as condition of doors, building structure, or locking system. Report to the Shift Manager. \_\_\_\_\_
12. Lock entry doors when leaving deactivated zones. \_\_\_\_\_
13. Have Manager check and initial patrol sheet. \_\_\_\_\_

PROCESS STANDARDS LIMITS	
	Limits
Basin Water Temperature in Degrees Fahrenheit	42 - 90
Basin Water Temperature in Degrees Centigrade	5.5 - 32.2
Basin Water Level	15' 6" - 16' 6"
Basin pH	5.5 - 9.5

9413221.2123

# CONTROL MASTER

IMPACT LEVEL <div style="text-align: center;">3ESQ</div>	SYSTEM <div style="text-align: center;">59-06</div>	ZONE/BLDG <div style="text-align: center;">105-KE</div>	TASK NO./PANEL NO. <div style="text-align: center;">1</div>	REV. <div style="text-align: center;">5</div>
SUPERSEDES ISSUE DATED <div style="text-align: center;">5-22-93</div>		ISSUE DATE <div style="text-align: center;">AUG 27 1993</div>		PAGE NO. <div style="text-align: center;">6 OF 14</div>

Approved By \_\_\_\_\_ Inspected By \_\_\_\_\_ Date \_\_\_\_\_

	READING/ OPERATION	NORMAL RANGE	DISCREPANCY	INITIALS
<b>CONTROL ROOM</b>				
1 Check Annunciator Operation				
2 Check the following annunciator bypass switches in ON or BYPASS position:				
2a BASIN LEVEL HI LLA-1A, 1B				
2b BASIN LEVEL LO LLA-1A, 1B				
2c COOLING WTR LO FLOW FA-1A				
2d BASIN HI TEMP TA-2 ALARM				
2e HEAT EXCHANGER PRI-SEC DIFF. PRESS				
2f MAIN CIRC PUMP FAILURE P-1A, 1B				
2g MAIN CIRC PUMP P-1A BYPASS P-1A				
2h MAIN CIRC PUMP P-1C BYPASS P-1C				
3 Basin water temperature #5 Record time TR-1	<div style="text-align: right;">°C</div> <div style="text-align: right;">°F</div> <div style="text-align: right;">Time</div>	7.2-15.6° C 45 - 60° F		
4 Basin water temperature #6 Record time TR-1	<div style="text-align: right;">°C</div> <div style="text-align: right;">°F</div> <div style="text-align: right;">Time</div>	7.2-15.6° C 45 - 60° F		
5 Basin water level, ft. Record time KE001-92-100K	<div style="text-align: right;">ft.</div> <div style="text-align: right;">Time</div>	15'10" - 16'2"		
6 Basin water level (Digital reading). Record time Flow Meter Model 187D	<div style="text-align: right;">level</div> <div style="text-align: right;">Time</div>	.333 - .667		
7 pH Reading AR-202		5.8-7.0		
8 Secondary water pressure PI-201-1B		70-150 psig		
9 Primary water pressure PI-201-2B		10-80 psig		
10 Primary/Secondary DP (Step 8 minus step 9)		minimum 8 psid		
11 Primary filter D/P #1-A, psid DPI-1A		1-25 psid		
12 Primary filter D/P #1-B, psid DPI-1B		1-25 psid		
13 Flow meter Model 900T		250-300 gpm		

944321.2124

IMPACT LEVEL 3ESQ	SYSTEM 59-06	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 1	REV. 5
SUPERSEDES ISSUE DATED 5-22-93		ISSUE DATE AUG 27 1993	PAGE NO. 7 OF 14	

CONTROL MASTER		READING/ OPERATION	NORMAL RANGE	DISCREPANCY	INITIALS
STORAGE AREA					
14 Check the following Composite Samplers for Sample Jug Overflow:					
14a	Composite sampler #1 Ion Column #1				
14b	Composite sampler #2 Ion Column #2				
14c	Composite sampler #3 Ion Column #3				
14d	Composite sampler #4 Cartridge filter inlet				
14e	Composite sampler #5 Cartridge filter outlet				
14f	Composite sampler #11 Sand filter inlet				
14g	Composite sampler #12 Sand filter outlet				
14h	Composite sampler #15 IXM inlet				
14i	Composite sampler #16 IXM outlet				
15 Check Operation of Composite Samplers, ON/OFF					
15a	Composite sampler #1 Ion Column #1				
15b	Composite sampler #2 Ion Column #2				
15c	Composite sampler #3 Ion Column #3				
15d	Composite sampler #4 Cartridge filter inlet				
15e	Composite sampler #5 Cartridge filter outlet				
15f	Composite sampler #11 Sand filter inlet				
15g	Composite sampler #12 Sand filter outlet				
15h	Composite sampler #15 IXM inlet				
15i	Composite sampler #16 IXM outlet				
16	Primary system valved to filter number 1A or 1B				
17	Primary pump #1-A ON/OFF Record pressure if ON		45-55 psig		
18	Primary pump #1-C ON/OFF Record pressure if ON		45-55 psig		
19	Viewing pit sump drained				

5212-1778116



IMPACT LEVEL 3ESQ	SYSTEM 59-06	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 1	REV. 5
SUPERSEDES ISSUE DATED 5-22-93		ISSUE DATE AUG 27 1993	PAGE NO. 8 OF 14	

CONTROL MASTER		READING/ OPERATION	NORMAL RANGE	DISCREPANCY	INITIALS
WATER COOLED BASIN CHILLER READINGS DATE: _____ Inspected By: _____					
20	Transfer switch is in BASIN CHILLER position (up position) SW 0003		BASIN CHILLER		
21	ON/OFF switch is set to ON		ON		
22	Purge OFF/AUTO switch is set to OFF		OFF		
23	Safety indicators on chiller control panel are in RESET position.		RESET		
24	Oil temperature - sump, °F				
25	Oil level				
26	Oil gage pressure, psig PI-212-7				
27	Evaporator gage pressure, psig PI-212-6				
28	Condenser gage pressure, psig PI-212-5				
29	Purge drum pressure, psig PI-212-8				
30	Control point setting				
31	% Current				
32	Condenser water d/p, psid PD1-212-1				
33	Primary water d/p, psid PD1-212-2				
34	Condenser inlet temperature, °F TI-212-1				
35	Condenser outlet temperature, °F TI-212-2				
36	Primary inlet temperature, °F TI-212-3				
37	Primary outlet temperature, °F TI-212-4				
38	Purge chiller for 30 minutes (Friday Only)				
39	Secondary water flow of chiller, gpm FOI-212-1				

9413221.2126

IMPACT LEVEL 3ESQ	SYSTEM 59-06	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 1	REV. 5
SUPERSEDES ISSUE DATED 5-22-93		ISSUE DATE AUG 27 1993	PAGE NO. 9 OF 14	

**CONTROL MASTER**

	READING/ OPERATION	NORMAL RANGE	DISCREPANCY	INITIALS
<b>AIR COOLED CONDENSOR UNIT READINGS</b>				
40 Transfer switch is in CONDENSING UNIT position (down position) SW 0003				
41 Evaporator inlet water temperature TI-225-1				
42 Evaporator outlet water temperature TI-225-2		75°F < basin temp		
43 Evaporator inlet water pressure PI-225-1		30-60 psi		
44 Evaporator outlet water pressure PI-225-2		30-60 psi		
<b>STORAGE AREA</b>				
45 Skimmer screens cleaned and adjusted				
46 Air samplers (2) by skimmer screens are On				
47 Visually check overhead vent fans are on				
48 Skimmer pump operation ON/OFF				
49 Skimmer pump valved to sand filter or basin				
50 Sand filter flow rate, gpm FOI-204-1		max 400 gpm		
51 Skimmer pump discharge pressure, psig PI-204-1		45-55 psig		
52 Sand filter inlet pressure, psig PI-204-2		45-55 psig		
53 Sand filter outlet pressure, psig PI-204-3		20-50 psig		
54 Sand filter differential pressure, psid (subtract step 53 from step 52) (PI-204-2) MINUS (PI-204-3)		5-20 psid		
55 Check NO flow from rupture disc discharge to pit No.1				
56 Transfer sump pumps valved to filter 5A or 5B				
57 Transfer sump pumps valved to tank or basin				

94322-2127

IMPACT LEVEL 3ESQ	SYSTEM 59-06	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 1	REV. 5
SUPERSEDES ISSUE DATED 5-22-93		ISSUE DATE AUG 27 1993	PAGE NO. 10 OF 14	

**CONTROL MASTER**

	READING/ OPERATION	NORMAL RANGE	DISCREPANCY	INITIALS
58 Storage basin sump pumps valved to filter 3A or 3B				
59 #1 Ion Cell/Flow, gpm		Max 50 gpm		
60 #2 Ion Cell/Flow, gpm		Max 50 gpm		
61 #3 Ion Cell/Flow, gpm		Max 50 gpm		
62 IXM system flow, gpm FI-204-1		145-165 gpm per module		
63 IXM inlet header pressure PI-205-1				
64 IXM outlet header pressure				
65 IXM #1 vent system pressure, psi				
66 IXM #2 vent system pressure, psi				
67 Transfer area heating system, ON/OFF				
68 Check glycol sightglass on heater				
69 Operation of swamp coolers, ON/OFF				
70 Primary water flow discharge #3, gpm FI-203-5				
71 Primary water flow discharge #2, gpm FI-203-4				
72 Primary water flow discharge #1, gpm FI-203-3				
73 Secondary water flow, gpm		400-500 gpm		
74 Rows containing irradiated fuel Locked and Tagged				
75 Weekly construction joint test hole inspection - East		SEE PAGE 4 STEP 5		
76 Weekly construction joint test hole inspection - West		SEE PAGE 4 STEP 5		
77 Check emergency lighting		Operational		

8212-1729146

IMPACT LEVEL 3ESQ	SYSTEM 59-06	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 1	REV. 5
SUPERSEDES ISSUE DATED 5-22-93		ISSUE DATE AUG 27 1993	PAGE NO. 11 OF 14	

CONTROL MASTER	READING/ OPERATION	NORMAL RANGE	DISCREPANCY	INITIALS
MCC ROOM				
78 Check transformer for visible signs of oil leak				
EXTERIOR DOORS				
79 Verify all exterior doors and security doors are closed and locked.				
OUTSIDE (NORTH SIDE)				
80 Level of waste storage tank - weekly check				
81 D Sump digital indicator level		0000.		
WEST SIDE FRONT FACE - UPSTAIRS				
82 Check operation of air compressor, psig		80-115 psig		
83 Blowdown both air receivers				

9473221.2129

IMPACT LEVEL 3ESQ	SYSTEM .59-06	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 1	REV. 5
SUPERSEDES ISSUE DATED 5-22-93		ISSUE DATE AUG 27 1993		PAGE NO. 12 OF 14

## CONTROL MASTER

HOUSEKEEPING				
VERIFY:	YES	NO	DISCREPANCY	INITIALS
1 Flammable and combustible materials are limited to the quantity required to meet current needs.				
2 Flammable and combustible materials are separated from ignition sources.				
3 Flammable and combustible liquids shall be kept to minimal levels.				
4 Flammable and combustible liquids are in approved containers.				
5 Halls, corridors, and exits are free of any obstructions.				
6 Storage of all materials is neat and in designated location.				

NOTE: Any substandard conditions discovered shall be responded to immediately.

OPERATOR'S NOTES:

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**K EAST VENTILATION RECORD**

REQUIRED SAMPLER CONFIGURATION vs. FAN OPERATION

**CONTROL MASTER**

EXHAUST FAN STATUS:

SAMPLER OPERATION:

FAN OPERATION	ROOF FAN NUMBERS (ON)	KE LOW EAST (#9)	KE LOW WEST (#10)	KE HIGH NORTH (#11)	KE HIGH SOUTH (#12)	SIGNATURE/DATE/TIME
Basin (Low Bay): Both ON	RV10 RV11	ON	ON			
Basin (Low Bay): Both OFF		OFF	OFF			
Basin (Low Bay): West Side ON Only	RV10	OFF	ON			
Basin (Low Bay): East Side ON Only	RV11	ON	OFF			
Transfer Area (High Bay): Both ON	RV6 RV7			ON	ON	
Transfer Area (High Bay): Both OFF				OFF	OFF	
Transfer Area (High Bay): South Side ON Only	RV6			OFF	ON	
Transfer Area (High Bay): North Side ON Only	RV7			ON	OFF	

1. Normal condition is both high bay and both low bay fans in operation.
2. If any fan is shutdown, notify Shift Manager and Effluent and Emissions Monitoring (3-4990).
3. Contact HPT and shutdown/startup samplers as necessary to match above chart. Sign, date, and record time next to sampler status established.

Shift Manager - Reviewed data, identified discrepancies, noted in log: Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

IMPACT LEVEL	SYSTEM	ZONE/BLDG.	TASK NO./PANEL NO.	REV.	SUPERSEDES ISSUE DATED	ISSUE DATED	Page
3ESQ	59-06	105-KE	1	5	5-22-93	AUG 27 1993	13 of 14

### Procedure Deviations/Discrepancies

To record deviations this report must include identification of the instruction(s) deviated from, the reason for deviation, and the duration of the change. Information must be validated by signature(s) of approver(s).

[illegible]Approver(s)/Date

## CONTROL MASTER

IMPACT LEVEL	SYSTEM	ZONE/BLDG.	TASK NO./PANEL NO.	REV.	SUPERSEDES ISSUE DATED	ISSUE DATED	Page
3ESQ	59-06	105-KE	1	5	5-22-93	AUG 27 1993	14 of 14

IMPACT LEVEL ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 9	REV. NEW
SUPERSEDES ISSUE DATED		ISSUE DATE FEB 15 1994		PAGE NO. 1 OF 8

COLLECT BASIN GRAB SAMPLES USING PORTABLE MASTERFLEX PUMP

PREPARED BY

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INFORMATION ONLY

*Dennis Stige* 2-10-94  
Plant Engineer Date

*Robert L Banks* 2-15-94  
K Basins Analyst Date

APPROVED BY

*raig A. Schilpant* 2-15-94  
Procedure Development Date

*J. D. [Signature]* 2/14/94  
K Basin Operations Date

*Darryl E. Hausmann* 2/11/94  
Engineering Date

*GM Davis* 2/11/94  
Quality Assurance Date

*Da [Signature]* 2/10/94  
Safety Technical Support Date

*Kenn Adameon* 2/11/94  
Facilities Health Physics Date

*[Signature]* 2-15-94  
Operations Analysis & Waste Handling Date

*[Signature]* 2-15-94  
Environmental Compliance Date

*Linn [Signature]* 2-15-94  
Operator Date



9413221.2133



IMPACT LEVEL  ESQ	SYSTEM  59-43	ZONE/BLDG  105-KE	TASK NO./PANEL NO.  9	REV.  NEW
SUPERSEDES ISSUE DATED		ISSUE DATE  FEB 15 1994	PAGE NO.  2 OF 8	

COLLECT BASIN GRAB SAMPLES USING PORTABLE MASTERFLEX PUMP

Initiated: Date \_\_\_\_\_ Time \_\_\_\_\_ Manager \_\_\_\_\_

Completed: Date \_\_\_\_\_ Time \_\_\_\_\_ Manager \_\_\_\_\_

Review for Completeness: Shift Manager \_\_\_\_\_

OPERATOR'S INITIALS REGISTER	
All operators performing steps in this procedure are required to register their name and initials below.	
1. _____ Print Name	_____ Initials
2. _____ Print Name	_____ Initials
3. _____ Print Name	_____ Initials

Introduction

This is a procedure to collect basin area grab samples using the portable Masterflex pump at 105-K East basin.

References

CFR 49, 173.400, Radioactive Material  
 WHC-CM-1-6, WHC Radiological Control Manual  
 WHC-CM-4-3, Industrial Safety Manual  
 WHC-CM-5-13, K Basins Policy Manual, 16-04  
 WHC-CM-7-5, Environmental Compliance Manual  
 WHC-NR-M-2, Vol 3, Process Standard C-303

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Safety

Safety Classification 3.

Comply with applicable RWP's and the approved Radiation Area Entry Permit.  
 Follow all standard and posted building safety rules.

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IMPACT LEVEL ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 9	REV. NEW
SUPERSEDES ISSUE DATED		ISSUE DATE FEB 15 1994	PAGE NO. 3 OF 8	

Safety (contd.)

Shaded text refers to Process Standard limits and controls.

IF a Process Standard limit and/or a control is NOT in compliance,  
CONTACT MANAGEMENT IMMEDIATELY.

Special Tools, Equipment, and Supplies

OA&WH Controlled Sampling Logbook  
Portable Masterflex pump  
New poly sample bottle(s)  
Self sticking sample bottle label  
15 feet of tygon tubing  
Maslin cloth  
Tape  
Plastic bags

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INFORMATION ONLY

Prerequisites

HPT available to monitor entire job.

Procedure

Date Initial

I. TAKE BASIN GRAB SAMPLE

1. Place silver paper on grating around sample area.  
DO NOT cover openings or unlevel areas with silver paper.

2. Place portable Masterflex pump on silver paper.

NOTE: When the FORWARD/OFF/REVERSE switch is set to FORWARD, the Masterflex suction line is to the right when looking at the pump impeller (nameplate end). The Masterflex discharge line is to the left when looking at the pump impeller.

3. Lower suction end of tygon tubing into basin water.
4. Place discharge end of tygon tubing through grating to discharge water into basin.

IMPACT LEVEL  ESQ	SYSTEM  59-43	ZONE/BLDG  105-KE	TASK NO./PANEL NO.  9	REV.  NEW
SUPERSEDES ISSUE DATED		ISSUE DATE  FEB 15 1994	PAGE NO.  4 OF 8	

Procedure (contd.)

UNCLASSIFIED  
INFORMATION

Date Initial

NOTE: Step 6 is to be performed while purging lines in Step 5.

5. Start pump by setting FORWARD/OFF/REVERSE switch to FORWARD, purge lines for one (1) minute, and then stop pump by setting FORWARD/OFF/REVERSE switch to OFF. \_\_\_\_\_
6. Adjust flow of pump to permit filling sample bottle without splashing. \_\_\_\_\_
7. Place discharge line into sample bottle. \_\_\_\_\_
8. Start pump by setting FORWARD/OFF/REVERSE switch to FORWARD, fill sample bottle, and then stop pump by setting FORWARD/OFF/REVERSE switch to OFF. \_\_\_\_\_
9. Pour sample bottle contents into basin. \_\_\_\_\_
10. Place discharge line into sample bottle. \_\_\_\_\_
11. Start pump by setting FORWARD/OFF/REVERSE switch to FORWARD, fill sample bottle, and then stop pump by setting FORWARD/OFF/REVERSE switch to OFF. \_\_\_\_\_
12. Set FORWARD/OFF/REVERSE switch to REVERSE to drain lines, and then stop pump by setting FORWARD/OFF/REVERSE switch to OFF when lines are drained. \_\_\_\_\_
13. Decontaminate tygon tubing while pulling tubing from basin water. Place tubing in plastic bag. \_\_\_\_\_
14. Wipe any liquid spilt on grating and dispose of rags into radioactive waste bag. \_\_\_\_\_
- ① 15. Have HPT survey sample for release from basin area and attach radiation label to each sample with dose rates, contamination levels, date of survey, and initials of person performing survey. \_\_\_\_\_

94-322-236

IMPACT LEVEL  ESQ	SYSTEM  59-43	ZONE/BLDG  105-KE	TASK NO./PANEL NO.  9	REV.  NEW
SUPERSEDES ISSUE DATED		ISSUE DATE  FEB 15 1994		PAGE NO.  5 OF 8

Procedure (contd.)

Date Initial

## II. LABEL AND TRANSPORT SAMPLE

1. Initiate a Chain of Custody Record for sample. \_\_\_\_\_
2. Fill in information on sample self-sticking label provided by OA&WH. \_\_\_\_\_
3. Place completed label on sample bottle. \_\_\_\_\_
4. Have OA&WH determine if sample is Type A, Type B, or Limited Quantity. \_\_\_\_\_

### WARNING

**Type A and Type B samples are packaged and transported to designated labs by Operations Analysis & Waste Handling.**

IF OA&WH determines sample is Type A or Type B, GO to step 5.

IF OA&WH determines sample is Limited Quantity, NA step 5 and GO to step 6.

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INFORMATION ONLY

5. Have OA&WH package and transport sample. NA the remainder of this procedure. \_\_\_\_\_
6. Package and handle sample per instructions on the Onsite Routine Radioactive Shipment Record (ORRSR), OR as instructed by OA&WH. \_\_\_\_\_
7. Tape sample bottle caps with poly tape. \_\_\_\_\_
8. Sign and date evidence tape. \_\_\_\_\_
9. Place evidence tape on sample bottle and cap. \_\_\_\_\_
10. Have qualified operator complete and sign ORRSR per WHC-CM-2-14, Part IV, 1.4, Onsite Routine Radioactive Shipments. \_\_\_\_\_

**NOTE:** ORRSR and Chain of Custody Record Sheet must accompany samples during shipment.

947322-2137

IMPACT LEVEL  ESQ	SYSTEM  59-43	ZONE/BLDG  105-KE	TASK NO./PANEL NO.  9	REV.  NEW
SUPERSEDES ISSUE DATED		ISSUE DATE  FEB 15 1994	PAGE NO.  6 OF 8	

Procedure (contd.)

Date Initial

11. Deliver sample to designated Lab and after the "received by" box is signed by the lab tech, sign the "relinquished by" box on the Chain of Custody Record Sheet.
12. Deliver Chain of Custody Record Sheet and ORRSR to OA&WH, room 1.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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IMPACT LEVEL ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 9	REV. NEW
SUPERSEDES ISSUE DATED		ISSUE DATE FEB 15 1994	PAGE NO. 7 OF 8	

# HP HOLD POINT CHECKLIST

Step Number	Step	HPT Signature
I.15	Have HPT survey sample for release from basin area and attach radiation label to each sample with dose rates, contamination levels, date of survey, and initials of person performing survey.	

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FOR REVIEW ONLY  
FOR REVIEW ONLY

### Procedure Deviations/Discrepancies

To record deviations this report must include identification of the instruction(s) deviated from, the reason for deviation, and the duration of the change. Information must be validated by signature(s) of approver(s).

Blank lined paper for writing.

Approver(s)/Date

IMPACT LEVEL	SYSTEM	ZONE/BLDG.	TASK NO./PANEL NO.	REV.	SUPERSEDES	ISSUE DATED	Page
ESQ	59-43	105-KE	9	NEW		FEB 15 1994	8 of 8

IMPACT LEVEL ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 10	REV. NEW
SUPERSEDES ISSUE DATED		ISSUE DATE FEB 15 1994	PAGE NO. 1 OF 8	

COLLECT CENTER OF BASIN AIR PERMIT WATER SAMPLE

PREPARED BY

Dennis Stege 2-10-94  
Plant Engineer Date

Robert L. Burke 2-11-94  
K Basins Analyst Date

APPROVED BY

Craig A. Schilb 2-15-94  
Procedure Development Date

John 2/14/94  
K Basin Operations Date

Bruce E. Harrison 2/11/94  
Engineering Date

Smith (on Davis) 2/11/94  
Quality Assurance Date

Don Oldham 2/15/94  
North Facilities Safety Assurance Date

Ken 2/15/94  
Safety Technical Support Date

Kevin Adamson 2/11/94  
Facilities Health Physics Date

Chris 2-15-94  
Operations Analysis & Waste Handling Date

Al 2-15-94  
Environmental Compliance Date

Chris J. Speer 2/11/94  
Operator Date



947322.214



IMPACT LEVEL ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 10	REV. NEW
SUPERSEDES ISSUE DATED		ISSUE DATE FEB 15 1994	PAGE NO. 2 OF 8	

COLLECT CENTER OF BASIN AIR PERMIT WATER SAMPLE

Initiated: Date \_\_\_\_\_ Time \_\_\_\_\_ Manager \_\_\_\_\_

Completed: Date \_\_\_\_\_ Time \_\_\_\_\_ Manager \_\_\_\_\_

Review for Completeness: Shift Manager \_\_\_\_\_

OPERATOR'S INITIALS REGISTER	
All operators performing steps in this procedure are required to register their name and initials below.	
1. _____ Print Name	_____ Initials
2. _____ Print Name	_____ Initials
3. _____ Print Name	_____ Initials

Introduction

This is a procedure to collect the center of basin air permit water sample at Sample Point 10 in the 105-K East basin. This sample is analyzed for Cesium-137 (Cs-137) specific activity. Encapsulation of fuel, pumping of sludge from the discharge chutes, or cleaning and crushing of canisters will be subject to the following actions. If the basin water Cs-137 radionuclide level exceeds level exceeds 15  $\mu\text{Ci/liter}$ , one of the following actions must be taken until the Cs-137 radionuclide level decreases below 15  $\mu\text{Ci/liter}$ : 1) All encapsulation of fuel, pumping of sludge from the discharge chutes, or cleaning and crushing of canisters shall be suspended or 2) Both water treatment systems must be placed in service.

If the basin water Cs radionuclide level exceeds 30  $\mu\text{Ci/liter}$ , all underwater encapsulation of fuel, pumping of sludge from the discharge chutes, or cleaning and crushing of canisters activities shall be suspended until the Cs-137 radionuclide level decreases below 15  $\mu\text{Ci/liter}$ .

The two water treatment systems are 1) three ion exchange columns, one cartridge filter, and one basin recirculation pump, and 2) one ion exchange module (IXM), sand filter, and skimmer pump.

941322-2142

IMPACT LEVEL ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 10	REV. NEW
SUPERSEDES ISSUE DATED		ISSUE DATE FEB 15 1994	PAGE NO. 3 OF 8	

### Introduction (contd.)

At least one center of basin (Sample Point 10) sample shall be taken per each 8-hour shift during sludge pumping or encapsulation operations. The sample shall be analyzed and the results of the analysis shall be reported to 105-K East Operations as soon as practical, but no later than the end of the next operating shift.

Canisters, other encapsulation equipment, or debris may be removed from the basin water only if the Cs-137 radionuclide level is less than 15  $\mu\text{Ci/liter}$ .

IF center of basin sampling equipment is out of service, operating procedure 59-43-8, "Collect Center of Basin Air Permit Water Sample Using Portable Masterflex Pump" is used to collect air permit water sample.

### References

KE Air Permit Compliance Sample Logbook  
 WHC-CM-1-6, WHC Radiological Control Manual  
 WHC-CM-4-3, Industrial Safety Manual  
 WHC-CM-5-13, K Basins Policy Manual, 16-04  
 WHC-CM-7-5, Environmental Compliance Manual  
 WHC-NR-M-2, Vol 3, Process Standard C-303

### Safety

Safety Classification 3.  
 Comply with applicable RWPs and the approved Radiation Area Entry Permit.  
 Follow all standard and posted building safety rules.

Shaded text refers to Process Standard limits and controls.

IF a Process Standard limit and/or a control is NOT in compliance,  
 CONTACT MANAGEMENT IMMEDIATELY.

### Special Tools, Equipment, and Supplies

KE Air Permit Compliance Sample Logbook  
 New 500 ml poly bottle  
 Self sticking sample bottle label  
 Tape

### Prerequisites

HPT available to monitor entire job.

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IMPACT LEVEL ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 10	REV. NEW
SUPERSEDES ISSUE DATED		ISSUE DATE FEB 15 1994	PAGE NO. 4 OF 8	

## Procedure

Date Initial

### I. TAKE CENTER OF BASIN (SAMPLE POINT 10) AIR PERMIT WATER SAMPLE

**NOTE:** IF center of basin sampling equipment is out of service, operating procedure 59-43-8, "Collect Center of Basin Air Permit Water Sample Using Portable Masterflex Pump" is used to collect air permit water sample.

1. Obtain new 500 ml poly sample bottle. \_\_\_\_\_

IF sample pump is not operating, GO to step 2.

OTHERWISE, NA step 2 and GO to step 3.

2. Start sample pump. \_\_\_\_\_
3. Purge sample line to ensure clean sample. \_\_\_\_\_
4. Fill sample bottle with sample from sample line. \_\_\_\_\_
5. Pour sample bottle contents into basin. \_\_\_\_\_
6. Refill sample bottle with sample from sample line. \_\_\_\_\_

Ⓜ

7. Have HPT survey sample for release from basin area and attach radiation label to each sample with dose rates, contamination levels, date of survey, and initials of person performing survey. \_\_\_\_\_

### II. LABEL AND ANALYZE SAMPLE

1. Initiate a Chain of Custody Record for sample. \_\_\_\_\_
2. Fill in information on sample self-sticking label found in KE Air Permit Compliance Sample Logbook. \_\_\_\_\_
3. Fill in information on copy of label in KE Air Permit Compliance Sample Logbook. \_\_\_\_\_
4. Place completed label on sample bottle. \_\_\_\_\_
5. Package and handle sample per instructions on the Onsite Routine Radioactive Shipment Record (ORRSR). \_\_\_\_\_

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IMPACT LEVEL ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 10	REV. NEW
SUPERSEDES ISSUE DATED		ISSUE DATE FEB 15 1994	PAGE NO. 5 OF 8	

Procedure (contd.)

Date Initial

6. Tape sample bottle caps with poly tape.
7. Sign and date evidence tape.
8. Place evidence tape on sample bottle and cap.
9. Have qualified operator complete and sign ORRSR per WHC-CM-2-14, Part IV, 1.4, Onsite Routine Radioactive Shipments.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

NOTE: ORRSR and Chain of Custody Record Sheet must accompany samples during shipment.

10. Deliver sample to 183-KE Water Lab and after the "received by" box is signed by the lab tech, sign the "relinquished by" box on the Chain of Custody Record Sheet.
11. Request results of the analysis be reported to 105-KE Operations and Operations Analysis and Waste Handling as soon as practical, but no later than the end of the next operating shift.
12. Deliver a copy of the Chain of Custody Record Sheet to 105-KE Basin Shift Manager in the Shift Manager's office, room 7, for record keeping.
13. Deliver Chain of Custody Record Sheet and ORRSR to OA&WH, room 1.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

IF previous water sample(s) for Cs-137 are ready to be returned from the 183-KE Water Lab, GO to step 14.

OTHERWISE, NA steps 14 thru 17, and GO to step 18.

14. Package and handle sample per instructions on the Onsite Routine Radioactive Shipment Record.
15. Sign the "received by" box and have the lab tech sign the "relinquished by" box on the Chain of Custody Record Sheet.

\_\_\_\_\_  
\_\_\_\_\_

94722-245

IMPACT LEVEL  ESQ	SYSTEM  59-43	ZONE/BLDG  105-KE	TASK NO./PANEL NO.  10	REV.  NEW
SUPERSEDES ISSUE DATED		ISSUE DATE  FEB 15 1994	PAGE NO.  6 OF 8	

Procedure (contd.)

Date Initial

16. Pour sample contents into basin and dispose of used sample bottle. \_\_\_\_\_
17. Sign the "Disposal Confirmed By" box on the Chain of Custody Record Sheet. \_\_\_\_\_

**WARNING**

Encapsulation of fuel, pumping of sludge from the discharge chutes, or cleaning and crushing of canisters will be subject to the following actions. If the basin water Cs-137 radionuclide level exceeds 15  $\mu\text{Ci/liter}$ , one of the following actions must be taken until the Cs-137 radionuclide level decreases below 15  $\mu\text{Ci/liter}$ : 1) All encapsulation of fuel, pumping of sludge from the discharge chutes, or cleaning and crushing of canisters shall be suspended or 2) Both water treatment systems must be placed in service.

If the basin water Cs radionuclide level exceeds 30  $\mu\text{Ci/liter}$ , all underwater encapsulation of fuel, pumping of sludge from the discharge chutes, or cleaning and crushing of canisters activities shall be suspended until the Cs-137 radionuclide level decreases below 15  $\mu\text{Ci/liter}$ .

Canisters, other encapsulation equipment, or debris may be removed from the basin water only if the Cs-137 radionuclide level is less than 15  $\mu\text{Ci/liter}$ .

**SAMPLE RESULTS**

18. Have Shift Manager record sample results below:

\_\_\_\_\_  $\mu\text{Ci Cs-137/liter radionuclide level}$  \_\_\_\_\_ \*

\* Shift Manager initials required

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IMPACT LEVEL ESQ	SYSTEM 59-43	ZONE/BLDG 105-KE	TASK NO./PANEL NO. 10	REV. NEW
SUPERSEDES ISSUE DATED		ISSUE DATE FEB 15 1994	PAGE NO. 7 OF 8	

# HP HOLD POINT CHECKLIST

Step Number	Step	HPT Signature
1.7	Have HPT survey sample for release from basin area and attach radiation label to each sample with dose rates, contamination levels, date of survey, and initials of person performing survey.	

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### Procedure Deviations/Discrepancies

### Deviations/Discrepancies

To record deviations this report must include identification of the instruction(s) deviated from, the reason for deviation, and the duration of the change. Information must be validated by signature(s) of approver(s).

[illegible]

Approver(s)/Date

**59-43-10.SOP**

IMPACT LEVEL	SYSTEM	ZONE/BLDG.	TASK NO./PANEL NO.	REV.	SUPERSEDES ISSUE DATED	ISSUE DATED	Page
ESQ	59-43	105-KE	10	NEW		FEB 15 1994	8 of 8

The following 100 Areas Facilities Health Physics Desk Instruction has been reviewed by the respective organizations and their concurrences below represent the acceptance of the 100 Areas FHP program for the Receiving, Analyzing, and Reporting Operations Process Monitoring Water Samples.

FHP-122

OPERATION OF THE CANBERRA ACCUSPEC GAMMA SPECTROSCOPY SYSTEM

CONCURRENCES:

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100 AREA FACILITIES HEALTH PHYSICS

DESK INSTRUCTION

Number

Page

Effective Date

Revision Number

FHP-122

1 of 13

12/28/93

03

TITLE:

OPERATION OF THE CANBERRA ACCUSPEC GAMMA  
SPECTROSCOPY SYSTEM

Approved by

*M. Kaviani*  
M. Kaviani, Manager  
100 Area FHP

### 1.0 Purpose

To facilitate proper operation of the Canberra Accuspec Gamma Spectroscopy System.

### 2.0 Overview

The guidance contained in this desk instruction will allow the HPT to count several types of samples on the Accuspec system. This instruction is designed to be used in conjunction with the HPTs training and manufacturers manuals.

### 3.0 Guidelines

#### 3.1 Energy Adjustment/Verification

1. Assure that the system is powered up.
2. Open the cover of the detector housing and place the Eu-152 calibration check source on top of the detector. The detector housing cover need not be closed for the performance of this adjustment/verification.
3. Press F1 to start the acquisition of data. Allow data to accumulate for a live time of approximately 30 seconds as read on screen.
4. Press F1 again to stop acquisition of data.
5. Simultaneously press the Ctrl and appropriate arrow key to move the cursor to vicinity of the 122 KEV peak. Once in the appropriate area, use only the arrow keys to move the cursor to the peak center.
6. Press F6 4-8 times to expand the region around the 122 KEV peak. Use the appropriate arrow key to position the cursor at the center of the peak.

94322-250

7. With the cursor positioned at the center of the peak, the display (top/right corner of screen) should read "121.78" +/- 0.5 KEV. If this value is not obtained, adjust as follows:
- Rotate the Z (Zero) control on the ADC to shift the spectrum as necessary.
  - Simultaneously press SHIFT and F2 to clear the spectrum.
  - Repeat steps 3 through 7 as necessary.
  - Once the peak is correctly set, proceed to step 8.
8. Press F5 4-8 times to unexpand and return the screen to normal.
9. Simultaneously press the Ctrl and appropriate arrow key to move the cursor to the vicinity of the 1408 KEV peak. Once in the vicinity of the 1408 KEV peak, use only the appropriate arrow key to position the cursor.
10. Press F6 4-8 times to expand the region around the 1408 KEV peak. Use the appropriate arrow key to position the cursor at the center of the 1408 KEV peak.
11. With the cursor positioned at the center of the peak, the display (top/right corner of screen) should read "1408" +/- 0.5 KEV. If not, adjust as follows:
- Rotate the Fine Gain control on the SAM in the direction that the peak must move. This is a very fine control and slight movement is required.
  - Simultaneously press SHIFT and F2 to clear the spectrum.
  - Repeat steps 3 and 4 to acquire a new spectrum.
  - Repeat step 11 as necessary.
  - When the peak is correctly set, return to step 12.
12. If adjustment of either control was required, repeat steps 3 through 11 to verify correct setting of both peaks.
13. Press F5 4-8 times to unexpand and return the screen to normal.
14. Simultaneously press SHIFT and F2 to clear the spectrum.
15. Remove the calibration check source from the detector housing and place in its storage location and document on Scheduled Radiation Survey Report for that task.

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### 3.3 COUNTING SAMPLES

PRIOR TO SAMPLE COUNTING THE DAILY BACKGROUND (FHP-126, SECTION 3.1) AND THE DAILY SOURCE CHECK (FHP-125) MUST BE PERFORMED

1. Verify the system is powered up, energy adjustment (Section 3.1), Source checked, and has had a daily background count performed by visually inspecting the Scheduled Radiation Survey Report Log.
2. Log the sample to be counted into the Laboratory Sample Log by assigning it the next sequential number and filling in the required data. The number format shall be KYY-XXX. The numbering system is as follows:
 

K: Facility code

YY: Last two digits of the year.

XXX: Sequential sample number for that year (obtained via Sample Log).
3. Depending on the type of sample to be analyzed, position the sample in one of the specific geometrical positions indicated below.

<u>Geometry File Name</u>	<u>Sample Location</u>	<u>Sample Container</u>
D5500M	Middle shelf	500 ml plastic coated glass jar
D5500H	High shelf	500 ml plastic coated glass jar
D5200M	Middle shelf	8 oz. plastic jar
D5200H	High shelf	8 oz. plastic jar
D547MM	Middle shelf	47 mm petri dish
D547MH	High shelf	47 mm petri dish
D54LAR	No holder	4 liter Marinelli (air)
D54LLQ	No holder	4 liter Marinelli (liquid)
D5500MA	No holder	500 ml Marinelli
D5500PM	Middle shelf	500 ml poly-bottle
D5500PH	High shelf	500 ml poly-bottle
D5500MS	No holder	500 ml Marinelli (soil)

K REFERS TO THE DETECTOR NUMBER THAT THE SAMPLE IS TO BE COUNTED ON

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4. Simultaneously press ALT and S to start the Autosequence file for sample counting. Autosequence initializes a series of prompts starting with (Auto  $\rho$ ) where  $\rho$  refers to the autosequence number, to appear at the bottom of the screen. Answer the questions as specified below:
- (Auto  $\rho$ ) Enter Configuration Name?:  
Type "DET $\zeta$ " and press the ENTER key. ( $\zeta$  refers to the detector number)
  - (Auto  $\rho$ ) Enter Live Time? [15:00]:  
Enter the live time the sample is to be counted in seconds or in hours:minutes:seconds format:  
  
Seconds: SSS  
Hours:minutes:seconds: HH:MM:SS  
Press ENTER.
  - (Auto  $\rho$ ) Enter the Name of the Geometry file?:  
Enter the appropriate file from step 4. Press ENTER.
  - (Auto  $\rho$ ) Enter Background Subtract File To Use [2000]:  
Enter the sample count time in seconds followed by the detector number (ie: 2000 $\zeta$  where  $\zeta$  is the detector number and 2000 is the count time in seconds.)
  - (Auto  $\rho$ ) Enter the File Name to save under:  
Enter the file number from step 2 in the EXACT format specified. Press ENTER.
  - (Auto  $\rho$ ) Output Results to Printer (Y/N)?:  
Enter Y. Press ENTER.
5. The screen will change to HEADER FILE MANAGER screen. Enter the appropriate information for the sample as follows:
- a. SAMPLE TITLE:  
Enter the title, including the originating location of the sample, then press ENTER.
  - b. SAMPLE ID:  
Press ENTER. This parameter is pre-set with 183KE HP LAB.
  - c. SAMPLE QUANTITY:  
Enter NUMBER of units (1, 5, 10, 1000, etc...). Press ENTER.
  - d. SAMPLE UNITS:  
Enter the TYPE of units (grams, ml, 100 cm<sup>2</sup>, liters, etc...). Press ENTER.

9473221-2153

100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number  
Page

FHP-122  
5 of 13

OPERATION OF THE CANBERRA ACCUSPEC GAMMA  
SPECTROSCOPY SYSTEM

Effective Date  
Revision Number

12/28/93  
03

- e. SAMPLE DATE:  
Enter the date and time that the sample was actually taken. Enter this parameter in the following EXACT format:

DD-MMM-YY HH:MM

Press ENTER

NOTE: You must include the space between date and time. The above format must be used or sample analysis will be lost.

- f. SAMPLE TYPE:  
Enter type of sample (air, water, soil, masslin). Press ENTER

6. Press F10 to initiate the exit command.
7. Press Y to save the changes made in steps 6 (a) through (f). The system will now begin to acquire data for the time specified. Upon completion the system will generate a report.

HOLD POINT: At the conclusion of data output TE Bratvold, JE Kurtz or SS Lewis must be notified and all data forwarded to one. Only TE Bratvold, JE Kurtz, or SS Lewis can release sample data/information to the customer.

3.4 RE-ANALYZE SPECTRAL DATA (from stored files):

1. Using the Laboratory Sample Log, determine the file number of the sample you wish to re-analyze.
2. Retrieve the archived storage disk containing that file.
3. Press the square button above the disk bay that you want to use. Rotate the lever counterclockwise to allow the disk to be removed from the bay. Remove the in-use disk from the Bernoulli drive and place it in a protective cover.
4. Place the disk containing archived data into the empty disk bay and close the latch.
5. Simultaneously press ALT and C to invoke the Autosequence 2 file. Autosequence 2 causes a series of questions, which start with Auto 2, to appear at the bottom of the screen. Answer the questions as specified below:
  - (Auto 2) Enter File Name to be copied:  
Enter file number obtained from step 1 (including any path statements). Press ENTER.
  - (Auto 2) Enter Configuration to be Used (DETO):  
Press ENTER. DETO is always used to re-analyze spectral data.

94322-2154

100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number  
Page

FHP-122  
6 of 13

OPERATION OF THE CANBERRA ACCUSPEC GAMMA  
SPECTROSCOPY SYSTEM

Effective Date  
Revision Number

12/28/93  
03

- (Auto 2) Enter Nuclide Library [N01]:  
Press ENTER to use library N01, or type S01 and press ENTER.
  - N01: General Use/Long Lived/Radon Daughters
  - S01: Standards Library

The system will re-analyze the data from disk and print a report.

6. After report printing, press F10 to return to data screen.
7. Remove the archived storage disk and insert the in-use disk into the disk bay. Close latch.
8. Return archived storage disk to binder for storage.

**HOLD POINT:** At the conclusion of data output TE Bratvold, JE Kurtz or SS Lewis must be notified and all data forwarded to one. Only TE Bratvold, JE Kurtz or SS Lewis can release sample data/information to the customer.

### 3.5 ENERGY AND FWHM CALIBRATION

1. Assure the system is powered up and verify energy adjustment (Section 3.1) completed by visually inspecting the Scheduled Radiation Survey Report Log.
2. Using the 47 mm petri dish calibration standard, log the standard into the Laboratory Sample Log by assigning the next sequential log number and recording other information. The number format is KYY-XXX and is explained as follows:
  - K: Facility Code
  - YY: Year
  - XXX: Sequential number for that year
3. Position the standard on the middle shelf of the sample holder.
4. Simultaneously press ALT and X to invoke Autosequence 3. Autosequence 3 contains sequences for analyzing standards and initializes the following series of questions:
  - (Auto 3) Enter Configuration Name?[DET1]:  
Type "DET $\zeta$ " and press the ENTER key. ( $\zeta$  refers to the detector number)
  - (Auto 3) Enter Live Time? [15:00]:  
Enter a minimum of 7200 seconds or 2:00:00 for HH:MM:SS formats. Press ENTER.
  - (Auto 3) Enter Name of the Geometry File?:  
Enter "D $\zeta$ 47MM ( $\zeta$  refers to the detector number). Press ENTER.

943221.2155

100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number  
Page

FHP-122  
7 of 13

OPERATION OF THE CANBERRA ACCUSPEC GAMMA  
SPECTROSCOPY SYSTEM

Effective Date  
Revision Number

12/28/93  
03

- (Auto 3) Enter the File Name to save under:  
Enter file number as obtained in step 2 in the EXACT format specified. Press ENTER.
  - (Auto 3) Output Results to Printer(Y/N)?:  
Enter Y. Press ENTER.
5. The screen will change to HEADER FILE MANAGER screen. Enter the appropriate information for the sample as follows:
- a. SAMPLE TITLE:  
ENTER the title of sample(including the Source serial #)
  - b. SAMPLE ID:  
Press ENTER. This parameter is pre-set with 183KE HP LAB.
  - c. SAMPLE QUANTITY:  
Enter 1 for the number of units. Press ENTER.
  - d. SAMPLE UNITS:  
Enter the TYPE of units (grams, ml, 100 cm<sup>2</sup>, liters). Press ENTER.
  - e. SAMPLE DATE:  
Enter the reference date and time of the standard in the following EXACT format:  
  
DD-MMM-YY HH:MM  
  
Press ENTER
- NOTE: You must include the space between date and time. The above format must be used or sample analysis will be lost.
- f. SAMPLE TYPE:  
Enter STANDARD as the type of sample. Press ENTER.
6. Press F10 to initiate the exit command.
7. Press Y to save the changes made in steps 6 (a) through (b). The system will now begin to acquire data for the time specified and upon completion the system will generate a report.
8. Press ESC five times.
9. Press C A E in order. This will set up for entering the files to use for energy calibration.

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10. Enter the following at the prompts at the screen bottom:

- (Auto  $\rho$ ) CERTIF file [AUTOCAL.CER]:  
Enter appropriate certificate file from Figure 1. Ensure you use the .CER extension. Press ENTER
- (Auto  $\rho$ ) DATA file [AUTOCAL.DAT]:  
Enter file number from step 2. Ensure you use the .DAT extension. Press ENTER
- (Auto  $\rho$ ) HEADER file [AUTOCAL.HDR]:  
Enter DET $\zeta$ .HDR and press ENTER

$\rho$  REFERS TO THE SEQUENTIAL COUNTING INITIALIZATION NUMBER  
 $\zeta$  REFERS TO THE DETECTOR NUMBER THAT THE SAMPLE WAS COUNTED  
ON

The system will now automatically perform an energy calibration and save the new parameters to the specified files.

11. Press ESC five times.
12. Press C A W in order. This will set up for entering the files for FWHM calibration.
13. Enter the following at the prompts at the screen bottom:

- (Auto  $\rho$ ) CERTIF file [AUTOCAL.CER]:  
Enter appropriate certificate file from Figure 1. Ensure you use the .CER extension. Press ENTER
- (Auto  $\rho$ ) DATA file [AUTOCAL.DAT]:  
Enter file number from step 2. Ensure you use the .DAT extension. Press ENTER
- (Auto  $\rho$ ) HEADER file [AUTOCAL.HDR]:  
Enter DET $\zeta$ .HDR and press ENTER.

$\rho$  REFERS TO THE SEQUENTIAL COUNTING INITIALIZATION NUMBER  
 $\zeta$  REFERS TO THE DETECTOR NUMBER THAT THE SAMPLE WAS COUNTED  
ON

The system will now automatically perform a FWHM calibration and save the new parameters to the specified files.

14. Press ESC five times and document completion on Scheduled Radiation Survey Report for this task.
15. Forward printouts from energy and FWHM calibrations to TE Bratvold or JE Kurtz for review and storage.

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### 3.6 EFFICIENCY CALIBRATION

1. Assure the system is powered up and verify energy adjustment (Section 3.1) completed by visually inspecting the Scheduled Radiation Survey Report Log.
2. Using the calibration standard for the efficiency file to be calibrated, log the standard into the Laboratory Sample Log by assigning the next sequential log number and recording other information. The number format is KYY-XXX and is explained as follows:

K: Facility Code

YY: Year

XXX: Sequential number for that year

4. Depending on the type of standard, position the standard in the appropriate geometrical position as indicated below.

<u>Geometry File Name</u>	<u>Sample Location</u>	<u>Sample Container</u>
D5500M	Middle shelf	500 ml plastic coated glass jar
D5500H	High shelf	500 ml plastic coated glass jar
D5200M	Middle shelf	8 oz. plastic jar
D5200H	High shelf	8 oz. plastic jar
D547MM	Middle shelf	47 mm petri dish
D547MH	High shelf	47 mm petri dish
D54LAR	No holder	4 liter Marinelli (air)
D54LLQ	No holder	4 liter Marinelli (liquid)
D5500MA	No holder	500 ml Marinelli
D5500PM	Middle shelf	500 ml poly-bottle
D5500PH	High shelf	500 ml poly-bottle
D5500MS	No holder	500 ml Marinelli (soil)

C REFERS TO THE DETECTOR NUMBER THAT THE SAMPLE IS TO BE COUNTED ON

9413221-2158

100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number  
Page

FHP-122  
10 of 13

OPERATION OF THE CANBERRA ACCUSPEC GAMMA  
SPECTROSCOPY SYSTEM

Effective Date  
Revision Number

12/28/93  
03

5. Simultaneously press ALT and X to invoke Autosequence 3. Autosequence 3 contains sequences for analyzing standards and causes the following series of questions to appear at screen bottom:

- (Auto 3) Enter Configuration Name? [DET1]:  
Type "DET5" and press the ENTER key. (5 refers to the detector number)
- (Auto 3) Enter Live Time? [15:00]:  
Enter a minimum of 7200 seconds or 2:00:00 for HH:MM:SS formats. Press ENTER.
- (Auto 3) Enter Name of the Geometry File?:  
Enter file selected from Figure 1 and press ENTER.
- (Auto 3) Enter the File Name to save under:  
Enter file number as obtained in step 2 in the EXACT format specified. Press ENTER.
- (Auto 3) Output Results to Printer(Y/N)?:  
Enter Y. Press ENTER.

6. The screen will change to HEADER FILE MANAGER screen. Enter the appropriate information for the sample as follows:

- a. SAMPLE TITLE:  
Enter the title of sample (including the Source serial #). Press ENTER.
- b. SAMPLE ID:  
Press ENTER. This parameter is pre-set with 183KE HP LAB.
- c. SAMPLE QUANTITY:  
Enter 1 for the number of units. Press ENTER.
- d. SAMPLE UNITS:  
Enter the TYPE of units (grams, ml, 100 cm<sup>2</sup>, liters). Press ENTER.
- e. SAMPLE DATE:  
Enter the reference date and time of the standard. Enter this parameter in the following EXACT format:  
  
DD-MMM-YY HH:MM  
  
Press ENTER.

NOTE: You must include the space between date and time. The above format must be used or sample analysis will be lost.

6512-173746

100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number  
Page

FHP-122  
11 of 13

OPERATION OF THE CANBERRA ACCUSPEC GAMMA  
SPECTROSCOPY SYSTEM

Effective Date  
Revision Number

12/28/93  
03

- f. SAMPLE TYPE:  
Enter STANDARD as the type of sample. Press ENTER.
7. Press F10 to initiate the exit command to acquire data.
8. Press Y to save the changes made in steps 6 (a) through (f). The system will now begin to acquire data for the time specified and upon timeout generate a report.
9. Press ESC five times.
10. Press C A F in order. This will set up for entering information for efficiency calibration of the geometry.
11. Enter the following at the prompts at the screen bottom:
- (Auto  $\rho$ ) CERTIF file [AUTOCAL.CER]:  
Enter appropriate certificate file from appendix A. Ensure you use the .CER extension. Press ENTER.
  - (Auto  $\rho$ ) DATA file [AUTOCAL.DAT]:  
Enter file number from step 2. Ensure you use the .DAT extension. Press ENTER.
  - (Auto  $\rho$ ) HEADER file [AUTOCAL.HDR]:  
Enter DET $\zeta$ .HDR and press ENTER.
  - (Auto  $\rho$ ) EFF file [AUTOCAL.EFF]:  
Enter efficiency file name from Figure 1 for the geometry being efficiency calibrated

$\rho$  REFERS TO THE SEQUENTIAL COUNTING INITIALIZATION NUMBER  
 $\zeta$  REFERS TO THE DETECTOR NUMBER THAT THE SAMPLE WAS COUNTED  
ON

The system will now automatically perform an efficiency calibration and save the new parameters to the specified files.

12. Press ESC five times.
13. Perform steps 1 through 12 for all geometries to be efficiency calibrated and document completion on Scheduled Radiation Survey Report for this task.
14. Forward all printouts to TE Bratvold or JE Kurtz for review and storage.

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100 AREA FACILITIES HEALTH PHYSICS DESK INSTRUCTION	Number Page	FHP-122 12 of 13
OPERATION OF THE CANBERRA ACCUSPEC GAMMA SPECTROSCOPY SYSTEM	Effective Date Revision Number	12/28/93 03

#### 4.0 Procedural References

1. 100 Area Facilities Health Physics Desk Instruction Manual, FHP-125, Operation Of the Canberra AccuSpec Gamma Spectroscopy System.
2. 100 Area Facilities Health Physics Desk Instruction Manual, FHP-126, Background Protocols for the Canberra AccuSpec Gamma Spectroscopy System.

#### 5.0 Technical and Manual References

1. WHC-CM-1-6, WHC Radiological Controls Manual, Article 551
2. WHC-CM-1-6, WHC Radiological Controls Manual, Article 562
3. Technical Manual, Canberra AccuSpec System
4. 100 Area FHP OJT Course, #022178, Task # 100-OJT-20

#### 6.0 Appendixes

Figure 1: AccuSpec Calibration Matrix

941322-216

Figure 1

Accuspec Calibration Matrix

Geometry	Energy	FWHM	Efficiency	Container	Certificate File	Efficiency File	Shelf
D547MM	X	X	X	47mm Petri Dish	E193.CER	D547MM.EFF	Middle
D547MH			X	47mm Petri Dish	E193.CER	D547MH.EFF	High
D5500M			X	500 ml Bottle	E196.CER	D5500M.EFF	Middle
D5500H			X	500 ml Bottle	E196.CER	D5500H.EFF	High
D5200M			X	8 oz. Jar	E194.CER	D5200M.EFF	Middle
D5200H			X	8 oz. Jar	E194.CER	D5200H.EFF	High
D54LAR			X	Air Marinelli	E036.CER	D54LAR.EFF	None
D54LLQ			X	Liquid Marinelli	E198.CER	D54LLQ.EFF	None
D5500MA			X	500 ml Marinelli Liquid	E500.CER	D5500MA.EFF	None
D5500PM			X	500 ml Poly-bottle	129B47.CER	D5500PM.EFF	Middle
D5500PH			X	500 ml Poly-bottle	129B47.CER	D5500PH.EFF	High
D5500MS			X	500 ml Marinelli-Soil	E500S.CER	D5500MS.EFF	None

C REFERS TO THE DETECTOR NUMBER

THE CONFIGURATION NAME MUST CORRESPOND TO THE DETECTOR NUMBER (ie. DETC)

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The following 100 Areas Facilities Health Physics Desk Instruction has been reviewed by the respective organizations and their concurrences below represent the acceptance of the 100 Areas FHP program for the Receiving, Analyzing, and Reporting Operations Process Monitoring Water Samples.

FHP-125

DAILY-SOURCE CHECK OF THE CANBERRA ACCUSPEC GAMMA SPECTROSCOPY SYSTEM

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L. C. Haslam 2/8/94

L. C. Haslam  
Safety

R. S. Gant 2/9/94

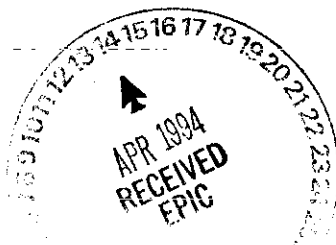
R. S. Gant  
K Basins Environmental Compliance

G. S. Hunacek

G. S. Hunacek  
K Basins Environmental Compliance

B. L. Curn 2/9/94

B. L. Curn  
Effluent and Emissions Monitoring



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100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number FHP-125  
Page 1 of 3  
Effective Date 1/03/94  
Revision Number 02

TITLE:

DAILY SOURCE CHECK OF THE CANBERRA  
ACCUSPEC GAMMA SPECTROSCOPY SYSTEM

Approved by:

  
M. Kaviani, Manager  
100 Area FHP

1.0 Purpose

To instruct the Health Physics Technician in the daily source check protocol for the Canberra Accuspec system.

2.0 Overview

The guidance contained within this desk instruction will allow the HPT to perform a daily source check for a given germanium detector in accordance with system Quality Control/Assurance.

3.0 Guidelines

1. Assure that the system is in calibration as determined by the presence of a current calibration sticker.
2. Assure that the system is powered up.
3. Verify the Daily Energy Adjustment was performed, in accordance with FHP-122, Section 3.1, by visually inspecting the Scheduled Radiation Survey Report for that task.
4. Verify that the daily background update has been performed in accordance with FHP-126, Section 3.1 by visually inspecting the Scheduled Radiation Survey Report for that task.

3.1 Daily Source Check

1. Open the cover of the detector housing and place the assigned source for the detector onto the detector canister. The assigned source can be determined by looking in the specific detector's section of the Gamma Detector Daily Source Checks binder.
2. Close the housing cover.
3. Simultaneously press the ALT and S keys on the computer keyboard.

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100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number  
Page

FHP-125  
2 of 3

DAILY SOURCE CHECK OF THE CANBERRA  
ACCUSPEC GAMMA SPECTROSCOPY SYSTEM

Effective Date  
Revision Number

1/03/94  
02

4. Follow the sequence below exactly, each answer is followed by pressing the "Enter" or "Return" Key.

Question

Answer

Enter Configuration Name?

"DET $\zeta$ " (where  $\zeta$  is the detector number)

Enter Live Time?

"2000"

Enter Name of Geometry File.

Enter the geometry name corresponding to the source being used. This information can be found in the specific detector's section of the Gamma Detector Daily Source Checks binder.

Enter Background Subtract File To Use.

"2000 $\zeta$ " (where  $\zeta$  is the detector number)

Enter File Name To Save Under.

"K"YY-XXX (where YY are the last two digits in the current year and XXX is the next sequential number in the Sample Log.)

Output Results To Printer Y/N ?

"Y"

The screen will change to HEADER FILE MANAGER screen. Enter the appropriate information for the sample as follows:

Question

Answer

Sample Title

"DAILY SOURCE CHECK"

Sample Id

Press Enter

Sample Quantity

Press Enter

Sample Units

Press Enter

Sample Date

Current Date in the following format: DD-MMM-YY HH:MM (where DD is the current day, MMM is the current month, YY are the last two digits of the current year, HH:MM is the current time in 24-hour format (there must be a space between the date and time.) and Press Enter.

Sample Type

Enter The Source serial number as found on the source or in the specific detector's section of the Gamma Detector Daily Source Checks binder and Press Enter.

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100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number  
Page

FHP-125  
3 of 3

DAILY SOURCE CHECK OF THE CANBERRA  
ACCUSPEC GAMMA SPECTROSCOPY SYSTEM

Effective Date  
Revision Number

1/03/94  
02

5. Press the F10 key. The Computer will prompt: "Save Changes and Exit To DOS?", Press "Y".
6. The system will count for 2000 seconds and initiate a report.
7. Upon completion of the printout, remove the last page and fax to 373-3362. Call TE Bratvold, or JE Kurtz. Phone and inform that the fax is transmitting.
8. The output will be plotted on the daily graph and checked to be within the  $2\sigma$  (95% confidence level) error limits for that source. If not within the required value, repeat the test.
9. If instrument again fails to fall within the required values, tag instrument out-of-service until problem has been corrected. If instrument falls within the required values, proceed to step 10.
10. Sign and date the final page of the instrument printout, then place it in the appropriate section of the Gamma Detector Daily Source Checks binder. The daily plots will be forwarded to laboratory upon completion for placement in the appropriate section of the Gamma Detector Daily Source Checks binder.

#### 4.0 Procedural References

- 4.1 100 Area Facilities Health Physics Desk Instruction Manual, FHP-122, Operation Of the Canberra AccuSpec Gamma Spectroscopy System.
- 4.2 100 Area Facilities Health Physics Desk Instruction Manual, FHP-126, Background Protocols for the Canberra AccuSpec Gamma Spectroscopy System.

#### 5.0 Technical and Manual References

- 5.1 WHC-CM-1-6, WHC Radiological Controls Manual, Article 551
- 5.2 WHC-CM-1-6, WHC Radiological Controls Manual, Article 562
- 5.3 Technical Manual, Canberra AccuSpec System

#### 6.0 Appendixes

None

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The following 100 Areas Facilities Health Physics Desk Instruction has been reviewed by the respective organizations and their concurrences below represent the acceptance of the 100 Areas FHP program for the Receiving, Analyzing, and Reporting Operations Process Monitoring Water Samples.

FHP-126

BACKGROUND PROTOCOLS FOR THE CANBERRA ACCUSPEC GAMMA SPECTROSCOPY SYSTEM

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B. L. Curn 2/9/94

B. L. Curn  
Effluent and Emissions Monitoring



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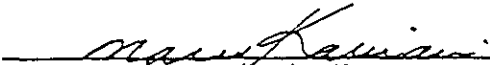
100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number FHP-126  
Page 1 of 8  
Effective Date 01/03/94  
Revision Number 02

TITLE:

Approved by:

BACKGROUND PROTOCOLS FOR THE CANBERRA  
ACCUSPEC GAMMA SPECTROSCOPY SYSTEM

  
M. Kaviani, Manager  
100 Area FHP

### 1.0 Purpose

To instruct the Health Physics Technician in the background counting protocols for the Canberra Accuspec system.

### 2.0 Overview

The guidance contained within this desk instruction will allow the HPT to perform any of the background counts for a given germanium detector in order to determine the environmental background in accordance with background subtraction routines.

### 3.0 Guidelines (these guidelines apply to all background counting protocols)

1. Assure that the system is in calibration as determined by the presence of a current calibration sticker on the computer controller.
2. Assure that the system is powered up.
3. Verify the Daily Energy Adjustment has been performed in accordance with FHP-122, Section 3.1 and documented on the Scheduled radiation Survey Report for that task.

#### 3.1 Daily Background Count (2000 second)

1. Log the "Daily 2000 Second Background" into the Sample Log. Make a note of the sample number that you logged this count under.
2. Simultaneously press the ALT and B keys.

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3. Follow the sequence below exactly. Each answer is followed by pressing the "Enter" or "Return" Key.

Question

Answer

Enter Configuration Name?

"DET $\zeta$ " (where  $\zeta$  is the detector number)

Enter Live Time?

"2000"

Enter Name of Geometry File.

"D $\zeta$ 500M" (where  $\zeta$  is the detector number)

Enter Background File To Update.

"2000 $\zeta$ " (where  $\zeta$  is the detector number)

Enter File Name To Save Under.

"K"YY-XXX (where YY are the last two digits in the current year and XXX is the next sequential number in the Sample Log (this is the sample number that the background count was logged in as in step 1.

Output Results To Printer Y/N ?

"Y"

The screen will change to HEADER FILE MANAGER screen. Enter the appropriate information for the sample as follows (each answer is followed by the Enter Key):

Question

Answer

Sample Title

"DAILY 2000 SECOND BACKGROUND, DETECTOR  $\zeta$ " (where  $\zeta$  is the detector number) and Press Enter.

Sample Id

Press Enter

Sample Quantity

Press Enter

Sample Units

Press Enter

Sample Date

Current Date in the following format: DD-MMM-YY HH:MM (where DD is the current day, MMM is the current month, YY are the last two digits of the current year, HH:MM is the current time in 24-hour format (there must be a space between the date and time.) and Press Enter.

Sample Type

"BACKGROUND" and Press Enter.

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100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number  
Page

FHP-126  
3 of 8

BACKGROUND PROTOCOLS FOR THE CANBERRA  
ACCUSPEC GAMMA SPECTROSCOPY SYSTEM

Effective Date  
Revision Number

12/14/93  
02

4. Press the F10 key. The Computer will prompt "Save Changes and Exit To DOS?" Press "Y".
5. The system will count for 2000 seconds, update the background file, and initiate a report. Upon completion of the report, fax the printout to 373-3362. Call TE Bratvold, or JE Kurtz, and inform that the fax is transmitting.
6. The output will be reviewed for inconsistencies and elevated background levels. If the system is suspect, tag the system Out-Of-Service until resolved.

3.2 Daily Background Count (4000 second)

Note: This background is performed on a single Accuspec detector System. If you are unaware of which system receives this count call TE Bratvold or JE Kurtz.

1. Log the "Daily 4000 Second Background" into the Sample Log. Make a note of the sample number that you logged this count under.
2. Simultaneously press the ALT and B keys.
3. Follow the sequence below exactly. Each answer is followed by pressing the "Enter" or "Return" Key.

Question

Answer

Enter Configuration Name?

"DET $\zeta$ " (where  $\zeta$  is the proper detector number for the 4000 second daily background count.)

Enter Live Time?

"4000"

Enter Name of Geometry File.

"D $\zeta$ 500M" (where  $\zeta$  is the detector number)

Enter Background File To Update.

"4000 $\zeta$ " (where  $\zeta$  is the detector number)

Enter File Name To Save Under.

"K"YY-XXX (where YY are the last two digits in the current year and XXX is the next sequential number in the Sample Log (this is the sample number that the background count was logged in as in step 1.

Output Results To Printer Y/N ?

"Y"

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100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number  
Page

FHP-126  
4 of 8

BACKGROUND PROTOCOLS FOR THE CANBERRA  
ACCUSPEC GAMMA SPECTROSCOPY SYSTEM

Effective Date  
Revision Number

12/14/93  
02

The screen will change to HEADER FILE MANAGER screen. Enter the appropriate information for the sample as follows (each answer is followed by the Enter Key):

Question

Answer

Sample Title

"DAILY 4000 SECOND BACKGROUND,  
DETECTOR 5" (where 5 is the detector number)

Sample Id

Press Enter

Sample Quantity

Press Enter

Sample Units

Press Enter

Sample Date

Current Date in the following format: DD-MMM-  
YY HH:MM (where DD is the current day, MMM  
is the current month, YY are the last two digits of  
the current year, HH:MM is the current time in  
24-hour format (there must be a space between  
the date and time.))

Sample Type

"BACKGROUND"

4. Press the F10 key. The Computer will prompt "Save Changes and Exit To DOS?" Press "Y".
5. The system will count for 4000 seconds, update the background file, and initiate a report. Upon completion of the report, fax the printout to 373-3362. Call TE Bratvold, or JE Kurtz, and inform that the fax is transmitting.
6. The output will be reviewed for inconsistencies and elevated background levels. If the system is suspect, tag the system Out-Of-Service until resolved.

3.3 Weekly Background Count (28800 second)

Note: This count is to be initiated at the end of a shift only.

1. Log the "Weekly 28800 Second Background" into the Sample Log. Make a note of the sample number that you logged this count under.
2. Simultaneously press the ALT and B keys.

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100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number  
Page

FHP-126  
5 of 8

BACKGROUND PROTOCOLS FOR THE CANBERRA  
ACCUSPEC GAMMA SPECTROSCOPY SYSTEM

Effective Date  
Revision Number

12/14/93  
02

3. Follow the sequence below exactly. Each answer is followed by pressing the "Enter" or "Return" Key.

Question

Answer

Enter Configuration Name?

"DET $\zeta$ " (where  $\zeta$  is the detector number)

Enter Live Time?

"28800"

Enter Name of Geometry File.

"D $\zeta$ 500M" (where  $\zeta$  is the detector number)

Enter Background File To Update.

"28800 $\zeta$ " (where  $\zeta$  is the detector number)

Enter File Name To Save Under.

"K"YY-XXX (where YY are the last two digits in the current year and XXX is the next sequential number in the Sample Log (this is the sample number that the background count was logged in as in step 1.

Output Results To Printer Y/N ?

"Y"

The screen will change to HEADER FILE MANAGER screen. Enter the appropriate information for the sample as follows (each answer is followed by the Enter Key):

Question

Answer

Sample Title

"Weekly 28800 SECOND BACKGROUND,  
DETECTOR  $\zeta$ " (where  $\zeta$  is the detector number)

Sample Id

Press Enter

Sample Quantity

Press Enter

Sample Units

Press Enter

Sample Date

Current Date in the following format: DD-MMM-YY HH:MM (where DD is the current day, MMM is the current month, YY are the last two digits of the current year, HH:MM is the current time in 24-hour format (there must be a space between the date and time.)

Sample Type

"BACKGROUND"

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100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number  
Page

FHP-126  
6 of 8

BACKGROUND PROTOCOLS FOR THE CANBERRA  
ACCUSPEC GAMMA SPECTROSCOPY SYSTEM

Effective Date  
Revision Number

12/14/93  
02

4. Press the F10 key. The Computer will prompt "Save Changes and Exit To DOS?" Press "Y".
5. The system will count for 28800 seconds, update the background file, and initiate a report. The next day, fax the printout to 373-3362. Call TE Bratvold, or JE Kurtz, and inform that the fax is transmitting.
6. The output will be reviewed for inconsistencies and elevated background levels. If the system is suspect, tag the system Out-Of-Service until resolved.

3.4 Quarterly Background Count (60 hours)

Note:      This count is to be initiated on a Friday at the end of shift only.

1. Log the "Quarterly 60 hour Background" into the Sample Log. Make a note of the sample number that you logged this count under.
2. Simultaneously press the ALT and B keys.
3. Follow the sequence below exactly. Each answer is followed by pressing the "Enter" or "Return" Key.

Question

Answer

Enter Configuration Name?

"DET $\zeta$ " (where  $\zeta$  is the detector number)

Enter Live Time?

"60:00:00.00"

Enter Name of Geometry File.

"D $\zeta$ 500M" (where  $\zeta$  is the detector number)

Enter Background File To Update.

"60 $\zeta$ " (where  $\zeta$  is the detector number)

Enter File Name To Save Under.

"K"YY-XXX (where YY are the last two digits in the current year and XXX is the next sequential number in the Sample Log (this is the sample number that the background count was logged in as in step 1.

Output Results To Printer Y/N ?

"Y"

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100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number  
Page

FHP-126  
7 of 8

BACKGROUND PROTOCOLS FOR THE CANBERRA  
ACCUSPEC GAMMA SPECTROSCOPY SYSTEM

Effective Date  
Revision Number

12/14/93  
02

The screen will change to HEADER FILE MANAGER screen. Enter the appropriate information for the sample as follows (each answer is followed by the Enter Key):

<u>Question</u>	<u>Answer</u>
Sample Title	"QUARTERLY 60 HOUR BACKGROUND, DETECTOR 5" (where 5 is the detector number)
Sample Id	Press Enter
Sample Quantity	Press Enter
Sample Units	Press Enter
Sample Date	Current Date in the following format: DD-MMM- YY HH:MM (where DD is the current day, MMM is the current month, YY are the last two digits of the current year, HH:MM is the current time in 24-hour format (there must be a space between the date and time.))
Sample Type	"BACKGROUND"

4. Press the F10 key. The Computer will prompt "Save Changes and Exit To DOS?" Press "Y".
5. The system will count for 60 hours, update the background file, and initiate a report. The next working day, fax the printout to 373-3362. Call TE Bratvold, or JE Kurtz, and inform that the fax is transmitting.
6. The output will be reviewed for inconsistencies and elevated background levels. If the system is suspect, tag the system Out-Of-Service until resolved.

#### 4.0 Procedural References

- 4.1 100 Area Facilities Health Physics Desk Instruction Manual, FHP-122, Operation Of the Canberra AccuSpec Gamma Spectroscopy System.
- 4.2 100 Area Facilities Health Physics Desk Instruction Manual, FHP-125, Daily Source Check of the Canberra AccuSpec Gamma Spectroscopy System.

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100 AREA FACILITIES HEALTH PHYSICS  
DESK INSTRUCTION

Number  
Page

FHP-126  
8 of 8

BACKGROUND PROTOCOLS FOR THE CANBERRA  
ACCUSPEC GAMMA SPECTROSCOPY SYSTEM

Effective Date  
Revision Number

12/14/93  
02

## 5.0 Technical and Manual References

5.1 WHC-CM-1-6, WHC Radiological Controls Manual, Article 551

5.2 WHC-CM-1-6, WHC Radiological Controls Manual, Article 562

5.3 Technical Manual, Canberra AccuSpec System

## 6.0 Appendixes

None

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Response to the  
Air Permit Conditions  
for the Notice of Construction  
for the 105-KE Basin Encapsulation Activity

**Reference: Letter 93-923, Additional Requirement 2: "Describe the possibility of piping around the ion exchange columns to operate the associated cartridge filters separate from the ion exchange columns."**

**Response:** Valves in the primary recirculation system, which contains the chiller, ion exchange columns and cartridge filters, allow the operation of a cartridge filter cell independent of the ion exchange columns. In early 1993, both the cartridge filters and sandfilter were used in an attempt to reduce the large quantities of sediment that became suspended during sludge pumping operations in late 1992. The incremental benefits of operating these two filtration systems together were never clearly evident.

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The cartridge filters are not currently being operated, because of associated waste issues. A redesignation of the spent cartridge filters has identified these filters as transuranic (TRU) waste. These filters were formerly designated as Low Level Radioactive waste. As a result of the designation change, an acceptable storage container had to be designed and built to store the spent TRU cartridge filters. As storage containers become available, spent cartridge filters will be removed from the basin proper and ultimately, new cartridge filters will be available for use. Operation of the cartridge filters carry substantial costs. Handling the filters as TRU waste increase both handling and storage costs. In addition, the change out and handling of the cartridges from a filter cell takes approximately 200 mRem of personnel exposure. While the above factors do not preclude the use of the cartridge filters, it tends to discourage the use of that personnel exposure for a routine practice. The option of using the cartridge filter cell (without the ion columns) as an adjunct to the routine system (ion exchange module + sandfilter) will be maintained in a discretionary manner. In addition, as required by the State of Washington Department of Health (DOH) direction, the cartridge filter cell (combined with the ion exchange columns) remains a substitute water treatment system (for the ion exchange modules combined with the sandfilter).

**Reference: Letter 93-923, Additional Requirement 7: "Provide documentation that describes criticality concerns in KE-Basin water filtration equipment."**

**Response:** A number of criticality documents were previously provided to DOH on September 16, 1992. As a supplement to those documents already provided, enclosed are two recent documents relating to criticality concerns in KE Basin water treatment systems:

1. WHC-SD-NR-CSER-011, "Criticality Safety Evaluation of the 100K Area Ion Exchange Modules and Ion Exchange Columns."
2. WHC-SD-NR-CSER-014, "Criticality Safety Evaluation Report for the 100 KE Basin Sandfilter Backwash Pit."

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J. D. Bauer, RL (E. T. Coenenberg, WHC)	A. W. Conklin, DOH	Incoming: 9400872 XRef: 9451697D
Subject: COMPLIANCE WITH AIR PERMIT CONDITIONS, AIR 93-908 AND 93-928; NOTICE OF CONSTRUCTION FOR THE 105-KE BASIN ENCAPSULATION ACTIVITY		

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